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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,655	12/30/2003	James Kenneth Aragones	RD28217-3	1654

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EXAMINER	
CRAIG, DWIN M	
ART UNIT	**PAPER NUMBER**
2123	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/22/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/707,655	ARAGONES, JAMES KENNETH	
	Examiner	Art Unit	
	Dwin M. Craig	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/23/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-36 have been presented for examination.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-36 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claim language fails to teach a *concrete useful and tangible result* as required by 35 U.S.C. § 101. For example, claim 1 teaches a method of creating a *detrended engine baseline model* this claimed limitation does not teach a *useful result*. A modified *baseline model* is an abstract concept and therefore does not constitute a statutory process, see (MPEP 2106.2 Mathematical Algorithms, August 2006 edition), further the currently claimed *baseline model* is not tangibly embodied in a computer memory or computer display and thereby fails to produce a *tangible result,* see (MPEP 2106.10 Computer-Related Nonstatutory Subject Matter, August 2006 edition). In conclusion the current claims fail to disclose an invention in any of the statutory categories of process, machine, manufacture or combination of matter.

2.1 Regarding claims 25, 34 and 36, the current claim language teaches computer executable instructions on a computer readable medium or functional descriptive material on a computer readable medium. The claim language fails to disclose a concrete tangible and useful result as discussed above, further these claims also fail to teach that the functional descriptive material is a computer component because the claimed computer readable media fails to become part of a

functioning machine when interpreted to be merely a floppy disk or some other type of storage media decoupled from a processor and/or a memory, see (MPEP 2106.10 Computer-Related Nonstatutory Subject Matter, August 2006 edition).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over 5,018,069 Pettigrew and in view of U.S. patent 5,727128 Morrison and in further view of U.S. Patent 5,075,881 Blomberg.

3.1 Independent claim 1 consists of *a system for performing baseline modeling comprising:*

1. *An engine service database containing engine data, wherein the engine data includes at least time-varying engine data;*

2. *a preprocessor for processing the engine data into a predetermined format; and*

3. *an engine baseline modeling component that builds an initial engine baseline model from the preprocessed data using regression analysis, wherein the regression analysis relates engine performance variables as a function of engine operating conditions,*

4. *wherein the engine baseline modeling component applies a smoothing algorithm to the initial engine baseline model to reduce the effects of time-varying engine data to generate a detrended engine baseline model.*

Pettigrew teaches, *An engine service database* (Col. 4 lines 35-54 and Col. 3 lines 55-67 and Col. 4 lines 1-4) *containing engine data, wherein the engine data includes at least time-varying engine data;* (Figure 4 #202) *and an engine baseline modeling component that builds an initial engine baseline model from the preprocessed data* (Figure 4 #214 and #212 and Figure 5 # 231 & 232 and Col. 3 lines 21-54 and Col. 5 lines 5-21 "…standard baseline" and Table 1 and Col. 7 lines 54-57 "…predetermined baselines" this describes *preprocessed data* and this describes building an initial baseline and Col. 10 liens 33-53 and "…value from baseline" and Col. 11 lines 39-57 "…operating baselines").

However, *Pettigrew* does not expressly disclose, *a preprocessor for processing the engine data into a predetermined format and using regression analysis wherein the regression analysis relates engine performance variables as a function of engine operating conditions and wherein the engine baseline modeling component applies a smoothing algorithm to the initial engine baseline model to reduce the effects of time-varying engine data to generate a detrended engine baseline model.*

Morrison teaches *a preprocessor for processing the engine data into a predetermined format* (Col. 3 lines 1-8 and Col. 6 lines 1-9) *and a baseline model from the preprocessed data using regression analysis,* (Figure 5 #116 and Col. 5 lines 18-37 and Col. 11 line 57 "…regression analysis" and Col. 12 line 19 "…regression analysis") *wherein the regression analysis relates performance variables as a function of operating conditions.* (Col. 6 lines 36-39 Figure 6 and Col. 9 lines 23-50).

Blomberg teaches, *wherein the baseline modeling component applies a smoothing algorithm* (Figures 6, 10, 20 and Col. 10 lines 43-57 and Col. 15 lines 15-67) *to the initial baseline model* (Figure 10) *to reduce the effects of time varying engine data to generate a detrended engine baseline model* (Col. 20 lines 49-63, "estimated model…").

Pettigrew, Morrison and *Blomberg* are analogous are because they are all from the same problem solving area of baseline modeling.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention was made to utilize the data preprocessing methods of *Morrison* and the *smoothing* methods of *Blomberg* in the baseline modeling methods of *Pettigrew* because *Morrison* teaches that a user can make corrections before quality of the process begins to deteriorate or in the case of regression analysis of an aircraft engine, before the engine fails *(see Morrison Col. 1 lines 25-35),* and *Blomberg* teaches that by improving the objective analysis of workload data, air flight safety can be improved *(Bloomberg Col. 3 lines 56-67 and Col. 4 lines 1-9).*

3.2 Regarding claim 2, *Pettigrew* does not expressly disclose a *smoothing algorithm.*

However, *Blomberg* teaches a *smoothing algorithm* (Figures 6, 10, 20 and Col. 10 lines 43-57 and Col. 15 lines 15-67).

3.3 Regarding claim 3 *Pettigrew* does not expressly disclose repeating a *smoothing algorithm*.

However, *Blomberg* teaches repeating *smoothing algorithm* (Figures 6, 10, 20 and Col. 10 lines 43-57 and Col. 15 lines 15-67).

3.4 Regarding claim 4, *Pettigrew* does not expressly disclose, *wherein the preprocessor comprises a data acquisition component that extracts engine data from the engine services database.*

However, *Morrison* teaches obtaining batch files from the data library (Figure 5 #102), and a preprocessor that preprocesses the data (Col. 3 lines 1-8).

3.5 Regarding claim 5, *Pettigrew* does not expressly disclose, *wherein the preprocessor comprises a data scrubbing component that cleans the engine data.*

However, *Morrison* teaches the functional equivalent of *wherein the preprocessor comprises a data scrubbing component that cleans the engine data* (Col. 3 lines 1-8 and Col. 4 lines 22-29 by lowering the residual error below a predetermined threshold the data is effectively *cleaned*).

3.6 Regarding claim 6, *Pettigrew* does not expressly disclose *wherein the preprocessor comprises a data-segmenting component that segments the engine data into a plurality of groups.*

However, *Morrison* teaches, the functional equivalent of *wherein the preprocessor comprises a data-segmenting component that segments the engine data into a plurality of groups* (Figures 3 & 4 and Figure 5 # 102, 104 & 106 and Col. 7 lines 5-67 and Col. 8 lines 57-67, "…other types or preprocessing").

3.7 Regarding claim 7, *Pettigrew* does not expressly disclose, *wherein the engine baseline modeling component comprises a metric component that validates the detrended engine baseline model.*

However, *Morrison* teaches the functional equivalent of, *wherein the engine baseline modeling component comprises a metric component that validates the detrended engine baseline model,* (Col. 16 lines 3-6 "Thereafter, the block 116 may compare the overall correlation coefficient to the threshold to determine of the new set of variables is adequate for use in creating the process model…").

3.8 Regarding claim 8, *Pettigrew* does not expressly disclose, *wherein the engine baseline modeling component comprises a heuristics component that generates rules for cleaning the preprocessed data.*

However, the examiner notes that Knowledge based systems rely on rules of thumb, (heuristics rather than mathematical certainty) *see US Patent 5,189,606 Col. 58 Lines 62-67 and Col. 59 lines 1-18*, therefore any knowledge based system, such as a neural network, would teach using a *heuristic* for cleaning preprocessed data, *Morrison* teaches training a neural network with a preprocessor (Col. 2 lines 66-67 and Col. 3 lines 1-63) the teachings of training a neural network as disclosed teaches the generating rules for cleaning the data in the preprocessor.

3.9 Regarding claim 9, *Pettigrew* discloses *further comprising a model diagnostics component that evaluates the performance of the detrended engine baseline model* (Figure 5 #251 and the descriptive text).

3.10 Regarding independent claim 10, the limitations for this claim are rejected for the reasons given above for independent claim 1, however, the examiner notes that the following limitations are missing from independent claim 1, specifically,

5. *A data-segmenting component that segments the engine data into a plurality of groups; and wherein the engine baseline-modeling component combines data from correlated groups.*

While *Pettigrew* does not expressly disclose, *A data segmenting component that segments the engine data into a plurality of groups; and wherein the engine baseline modeling component combines data from correlated groups.*

However, *Morrison* teaches, the functional equivalent of *wherein the preprocessor comprises a data-segmenting component that segments the engine data into a plurality of groups and combines that data from correlated groups* (Figures 3 & 4 and Figure 5 # 102, 104 & 106 and Col. 7 lines 5-67 and Col. 8 lines 57-67, "...other types or preprocessing").

3.11 Regarding claim 11, *Pettigrew* does not expressly disclose, *wherein the combination of data from correlated groups is performed by utilizing a weighted average technique to fit all engine baseline parameter trends to one primary trend.*

However, *Blomberg* discloses the functional equivalent of the claim 11, using exponential weighted averages, (Figure 19 and Col. 15 lines 15-67 more specifically, "A0 is the value of the calculated exponential average...") and *Morrison* teaches performing a curve/line fit to the data (Col. 4 lines 22-29).

3.12 Regarding independent claim 12 the limitations for this claim are rejected for the reasons given above for independent claim 1, however, the examiner notes that the following limitations are missing from independent claim 1, specifically,

6. *A data-segmenting component that segments the engine data into a plurality of groups; and wherein the engine baseline-modeling component identifies segments relating to related engines.*

While *Pettigrew* does not expressly disclose *a data-segmenting component that segments the engine data into a plurality of groups; Pettigrew* teaches *wherein the engine baseline-modeling component identifies segments relating to related engines* (Figure 4 # 225 and the descriptive text).

Morrison teaches *a data-segmenting component that segments the engine data into a plurality of groups* (Figures 3 & 4 and Figure 5 # 102, 104 & 106 and Col. 7 lines 5-67).

3.13 Regarding claim 13, the rejection of claim 1 wholly covers the claimed limitations in claim 13.

3.14 Regarding claim 14, *Pettigrew* does not expressly disclose *wherein the smoothing algorithm includes a moving average calculation.*

However, *Blomberg* discloses the functional equivalent of the claim 14, using exponential weighted averages, (Figure 19 and Col. 15 lines 15-67 more specifically, "A0 is the value of the calculated exponential average…") and *Morrison* teaches performing a curve/line fit to the data (Col. 4 lines 22-29).

3.15 Regarding claim 15, *Pettigrew* does not expressly disclose *repeating a smoothing algorithm.*

However, *Blomberg* teaches repeating *smoothing algorithm* (Figures 6, 10, 20 and Col. 10 lines 43-57 and Col. 15 lines 15-67).

3.16 Regarding claim 16, *Pettigrew* does not expressly disclose, *further comprising extracting the engine data from the engine services database.*

However, *Morrison* teaches obtaining batch files from the data library (Figure 5 #102), and a preprocessor that preprocesses the data (Col. 3 lines 1-8).

3.17 Regarding claim 17, *Pettigrew* does not expressly disclose, *wherein the processing step comprises further comprises cleaning the engine data.*

However, *Morrison* teaches the functional equivalent of *wherein the processing step comprises further comprises cleaning the engine data*, (Col. 3 lines 1-8 and Col. 4 lines 22-29 by lowering the residual error below a predetermined threshold the data is effectively *cleaned*).

3.18 Regarding claim 18, *Pettigrew* does not expressly disclose, *wherein the processing step further comprises segmenting the engine data into a plurality of groups.*

However, *Morrison* teaches *wherein the processing step further comprises segmenting the engine data into a plurality of groups* (Figures 3 & 4 and Figure 5 # 102, 104 & 106 and Col. 7 lines 5-67).

3.19 Regarding claim 19, *Pettigrew* does not expressly disclose, *further comprising validating the detrended engine baseline model.*

However, *Morrison* teaches the functional equivalent of, *further comprising validating the detrended engine baseline model,* (Col. 16 lines 3-6 "Thereafter, the block 116 may compare

the overall correlation coefficient to the threshold to determine of the new set of variables is adequate for use in creating the process model...").

3.20 Regarding claim 20, *Pettigrew* does not expressly disclose, *further comprising generating rules for cleaning the preprocessed data.*

However, the examiner notes that Knowledge based systems rely on rules of thumb, (heuristics rather than mathematical certainty) *see US Patent 5,189,606 Col. 58 Lines 62-67 and Col. 59 lines 1-18*, therefore any knowledge based system, such as a neural network, would teach using a *heuristic* for cleaning preprocessed data, *Morrison* teaches training a neural network with a preprocessor (Col. 2 lines 66-67 and Col. 3 lines 1-63) the teachings of training a neural network as disclosed teaches the generating rules for cleaning the data in the preprocessor.

3.21 Regarding claim 21, *Pettigrew* teaches *further comprising evaluating the performance of the detrended engine baseline model* (Figure 4 #224, 227 & 228 and the descriptive text).

3.22 Regarding independent claim 22, the limitations for this claim are rejected for the reasons given above for independent claim 1, however, the examiner notes that the following limitations are missing from independent claim 1, specifically,

6. *Segmenting the engine data into a plurality of groups; and identifying correlated groups of engine data based on a an initial engine baseline model.*

While *Pettigrew* does not expressly disclose *a data-segmenting component that segments the engine data into a plurality of groups; Pettigrew* teaches *wherein the engine baseline-*

modeling component identifies segments relating to related engines (Figure 4 # 225 and the descriptive text).

Morrison teaches *a data-segmenting component that segments the engine data into a plurality of groups* (Figures 3 & 4 and Figure 5 # 102, 104 & 106 and Col. 7 lines 5-67).

3.23 Regarding claim 23, *Pettigrew* does not expressly disclose, *wherein the step of combining of data from correlated groups comprises utilizing a weighted average technique to fit all engine baseline parameter trends to one primary trend.*

However, *Blomberg* discloses the functional equivalent of the claim 14, using exponential weighted averages, (Figure 19 and Col. 15 lines 15-67 more specifically, "A0 is the value of the calculated exponential average…") and *Morrison* teaches performing a curve/line fit to the data (Col. 4 lines 22-29).

3.24 Regarding claim 24, the rejection presented for claim 1, wholly meets the claimed limitations as set forth; see the rejection for claim 1.

3.25 Regarding claim 25, the rejection presented for claim 1, wholly meets the claimed limitations as set forth; see the rejection for claim 1.

3.26 Regarding claim 26, the rejection presented for claim 2, wholly meets the claimed limitations as set forth; see the rejection for claim 2.

3.27 Regarding claim 27, the rejection presented for claim 3, wholly meets the claimed limitations as set forth; see the rejection for claim 3.

3.28 Regarding claim 28, the rejection presented for claim 4, wholly meets the claimed limitations as set forth; see the rejection for claim 4.

3.29 Regarding claim 29, the rejection presented for claim 5, wholly meets the claimed limitations as set forth; see the rejection for claim 5.

3.30 Regarding claim 30, the rejection presented for claim 6, wholly meets the claimed limitations as set forth; see the rejection for claim 6.

3.31 Regarding claim 31, the rejection presented for claim 7, wholly meets the claimed limitations as set forth; see the rejection for claim 7.

3.32 Regarding claim 32, the rejection presented for claim 8, wholly meets the claimed limitations as set forth; see the rejection for claim 8.

3.33 Regarding claim 33, the rejection presented for claim 9, wholly meets the claimed limitations as set forth; see the rejection for claim 9.

3.34 Regarding claim 34, the rejection presented for claim 22, wholly meets the claimed limitations as set forth; see the rejection for claim 22.

3.35 Regarding claim 35, the rejection presented for claim 23, wholly meets the claimed limitations as set forth; see the rejection for claim 23.

3.36 Regarding claim 36, the rejection presented for claim 22, wholly meets the claimed limitations as set forth; see the rejection for claim 22.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dwin M. Craig whose telephone number is (571) 272-3710. The examiner can normally be reached on 10:00 - 6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul L. Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Dwin M. Craig

12/19/06

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